position of the cyclonic tracks and their dependence on the general (seasonal) distribution of pressure and of temperature over Europe and the Atlantic Ocean are seen to be controlling factors in the production of the different weather types.

THE FIRST DAILY WEATHER MAP.

ONE of the important dates in meteorology, about which there has been a good deal of dispute lately, is that which marks the issue of the first daily weather map. The credit of having been the first to publish such a map has been generally given to Le Verrier, who, on September 16, 1863, began the issue of a daily weather map in Paris. It is a fact, however, that twelve years before that, in 1851, a weather map based on observations made on the day of its publication was issued and sold in the Great Exhibition in England. The data for the map were collected by telegraph, and its publication was continued from August 8 to October 11, 1851, Sundays excepted. This was without doubt the first daily weather map. The September number of *Symons' Meteorological Magazine* contains a reproduction, about one-quarter the size of the original, of the Great Exhibition map of August 8, 1851.

R. DEC. WARD.
HARVARD UNIVERSITY.

NOTES ON INORGANIC CHEMISTRY.

A NEW element appears to have been discovered in monazite, to which the discoverer, P. Barrière gives the name *Lucium*. It is closely akin to the rare earths, perhaps most resembling erbium, though with quite different spectral rays. Its atomic weight is calculated as 104. The elementary nature of the substance is reported to have been confirmed by Schützenberger, Cleve, Fresenius and Boisbaudran. The only thing which seems to render the discovery questionable is that Barrière proposes to use the substance for the production of incandescent gas light in competition with the Welsbach burner and without infringing upon the patents which practically cover the use of all the rare earths now known.

IN a recent number of the Comptes Rendue, Moissan has summed up his researches on metallic carbids. In the electrical furnace no compounds with carbon could be formed with gold, bismuth or tin. Silver and the platinum metals take up carbon, but all separates out as graphite on cooling. No crystallized iron carbid could be formed. Copper takes up a trace of carbon only, but it materially effects its properties. The metals of the alkalies and alkaline earths form crystalline carbids which are decomposed by cold water with the evolution of acetylene. The carbids of aluminum and glucinum with water give off methane; the carbid of cerium, acetylene and methane; the carbid of manganese, methane and hydrogen; the carbid of uranium, methane, hydrogen and ethylene. The latter also gives off liquid and solid hydrocarbons in considerable quantity, as do in smaller quantities, the carbids of cerium and lanthanum. The carbids of molybdenum, tungsten and chromium fuse only at high temperature and are not acted on by water in the cold. In addition the carbids of silicon (carborundum), titanium, zirconium and vanadium, formed only at very high temperature are known. The fact of the formation of different hydrocarbons by the action of water upon the metallic carbids may have a decided bearing on the formation of petroleum and natural gas, and other hydrocarbons occurring in nature.

ROSSEL has followed up the researches in which Moissan found that the carbon of iron which had been saturated at 3000° and cooled under great pressure, crystallized out in small diamonds. Examining very hard steel, formed under similar conditions, Rossel finds a considerable quantity of crystallized carbon, which resembles Moissan's

THE MAN IN THE MOON.

In the *Correspondenz-Blatt* for July, of the German Anthropological Society, R. Behla has a curious study on the notions of various peoples as to what we see in the moon. These notions are strangely divergent. In most European nations there is a fancy that in the full moon there are the features of a human face, and hence the tales about 'the man in the moon.'

On the other hand, very widely throughout Asia, in both Aryan and Mongolian folklore, not a human being, but a hare, or rabbit, is believed to be seen, sitting on his haunches, in the orb of the moon. This also recurs among the Mexican Aztecs, though in South America again, among some Brazilian tribes, the man in the moon reappears.

In English and the Romance languages the moon is regarded as feminine, as was also the case among the Semites; but in German it is a masculine noun. This is usually the case among savage tribes, and often with them the sun is female, the wife or sister of the moon, and his inferior.

Behla adds some words on the importance of a more thorough comparative study of superstitions regarding the moon than we have at present.

D. G. Brinton.
University of Pennsylvania.

CURRENT NOTES ON METEOROLOGY.

ATMOSPHERIC ELECTRICITY AND TELEPHONES.

An interesting paper by Trabert, on the crackling of the telephone on the Sonnblick, appears in the Fourth Report of the Sonnblick Verein. The Sonnblick, it may be stated, is one of the best known mountain observatories in the world, by reason of its height (10,154 ft.), and especially by reason of the valuable results which have been derived by Hann and others from the observations there made. For six years five observations a day have been made of the intensity of the crackling in the telephone at the summit. It appears from these data that in December the minimum crackling is at noon, with the maximum at 9 p. m., and a secondary maximum at 7 a. m., while in June there is a steady increase in the intensity of the noise from 7 a. m. to 9 p. m., without a noon minimum. The other months of winter and summer follow respectively the same rule as December and June, while the intermediate months, as expected, present the intermediate conditions. Further, the noise is greater in summer than in winter. Regarding the explanation of these phenomena, the author finds it chiefly in the presence of atmospheric electricity in the clouds over the Sonnblick, for there is a very striking correspondence between the crackling and the cloudiness on the summit, not only in the diurnal period, but in the annual as well. The days on which there is the greatest intensity of crackling are almost invariably distinguished by cloudiness, rain, snow or thunderstorms. The part played by earth currents must not be overlooked, for on one cloudless anticyclonic day there was a very well marked crackling, which could not be explained as being due to atmospheric electricity.

WEATHER FORECASTS SEVERAL DAYS IN ADVANCE.

An elementary discussion of the controls of the weather of central Europe, with suggestions as to weather forecasts for several days in advance, has recently been issued by Dr. van Bebber. It is entitled *Die Beurtheilung des Wetters auf mehrere Tage im Voraus* (Stuttgart, Enke, 1896). Five principal weather types are considered, depending chiefly on the position of the areas of high pressure. The weather conditions which these types usually bring are described, and the increased or decreased frequency of the types at different seasons is noted. The

appointed director of the Botanical Garden of that city. His travels in Australia for botanical purposes, on foot and on horseback, covered some 25,000 miles. He was a voluminous author, and his writings are mostly of a strictly scientific character. The titles of over a hundred papers by Müller are given in the Royal Society's List. His 'Fragmenta Phytographiæ Australiæ' covers a dozen volumes. He cooperated with the late Mr. Bentham in compiling the 'Flora Australiensis,' which extends to several volumes. He is also the author of works on the 'Plants of Victoria,' on eucalyptus and on other botanical subjects.

DR. MAX MÜLLER, son of the great physiologist Johannes Müller, himself an eminent surgeon and the author of important contributions to the science, died at Cologne on September 3d.

DR. C. E. BROWN-SEQUARD, the only son of the late eminent man of science, and himself engaged in scientific work, has died at Atlanta, Ga., at the age of 30 years.

THE Fourteenth Congress of the American Ornithologists' Union will convene in Cambridge, Mass., on Monday, November 9th, at 8 o'clock p. m. The evening session will be devoted to the election of officers and the transaction of other routine business. The meetings open to the public, and devoted to the reading and discussion of scientific papers, will be held in the Nash Lecture-room, University Museum, Oxford St., beginning Tuesday, November 10th, at 10 a. m., and continuing for three days. Information regarding the Congress can be had by addressing the Secretary, Mr. John H. Sage, Portland, Conn.

THE German Botanical Society met at Frankfort-on-Main on September 22d. The French Association of Surgeons met at Paris on October 19th.

ACCORDING to *Nature* Dr. H. O. Forbes, in an inaugural address delivered before the Biological Society of Liverpool on Friday last, urged the amalgamation of all the local societies interested in biological science. He suggested that such a conjoint society meeting in some central place and to be called, perhaps, the Biological Institute of Liverpool, or the Liverpool Institute of Natural Science, or if all the scientific societies could be induced to unite, the Royal Society of Liverpool, as was the suggestion, some ten years ago, of Prof. Herdman, might be instituted on the model of the New Zealand Institute. Such a combined society in Liverpool would command wider recognition, and contribute more to the advancement of science, than is at present possible with disjointed forces. Dr. Forbes also expressed the hope that two other scientific institutions of the highest educational value, urgently required in a city like Liverpool—a zoological garden and a resuscitated botanical garden under a trained botanist, both conducted in a thoroughly scientific manner—might be accomplished facts before the end of this century.

M. HENRI MOISSAN gave, on the evening of October 27th, at the College of Physicians and Surgeons, New York, a lecture, with experiments, on his researches with the electric furnace, by invitation of the New York Academy of Sciences, the New York Section of the American Chemical Society, the American Institute of Electrical Engineers, the College of Pharmacy of the City of New York, and the New York Section of the Society of Chemical Industry. On the evening of October 28th a banquet was given in New York in honor of M. Moissan.

DR. HEINRICH KAYSER, professor of physics in the University of Bonn, has just returned to Germany, after having spent six weeks in America, making studies in astrophysics and spectroscopy.

HON. BERTRAND RUSSELL, fellow of Trinity College, Cambridge, has arrived in America, and will deliver a course of lectures on *Non-Euclidean Geometry*, at Bryn Mawr College and at Johns Hopkins University.

MR. CHARLES D. WALCOTT, director of the United States Geological Survey, is at present on the Pacific coast, where he is making an inspection of the work accomplished during the summer and arranging for the future conduct of the surveys.

PROF. PHILLIPS, of the mathematical department of Yale University, will revise the series of mathematical text-books of the late Prof. Loomis.

diamonds. Some of these crystals are more than half a millimeter in diameter.

J. L. H.

ASTRONOMICAL NOTES.

The *Astronomische Nachrichten* of October 5 contains an extended article by Dr. Paul Harzer upon the influence of gravity on the circles of astronomical instruments. This subject, which was treated by Bessel in the last paper he ever wrote, seems to possess theoretical rather than practical interest.

The Academy of Sciences of St. Petersburg has published a careful investigation of the errors of a micrometric apparatus constructed for the Academy by the Messrs. Repsold. The apparatus is intended for the accurate measurement of astronomical photographs, and its investigation has been carried out at the Poulcova observatory by Messrs. Renz and Kostinsky.

The Washburn Observatory has issued Vol. X., Part I of its publications. It contains Prof. Comstock's observations of double stars made between the years 1892 and 1896.

H. J.

SCIENTIFIC NOTES AND NEWS.

The great physiologist, Dr. Moritz Schiff, professor at Geneva, died on October 6th.

Dr. M. W. Drobisch, professor of philosophy in the University of Leipzig, died on September 30th, at the advanced age of 94 years. Drobisch was one of the most eminent of Herbart's followers, and had made contributions to mathematics as well as to philosophy.

François Felix Tisserand, director of the Paris Observatory, professor of astronomy in the Paris faculty of sciences, and member of the Institute, died from apoplexy at Paris on October 20th. Tisserand was born January 15, 1845. He was assistant in the Paris Observatory and was appointed director of the Observatory of Toulouse and professor in the faculty of sciences in that city in 1873. He was appointed first professor of mechanics at Paris, and later professor of astronomy. He was made director of the Paris Observatory in 1892, in the place of the late Admiral Monchez.

The Australian geologist, Baron Heinrich Freiherr von Foullon-Norbeeck, was killed on August 10th by natives on the island of Guadalcanara, one of the Solomon group. He had landed with a party from the German warship *Albatross*, to explore the mountains of the island, when the party was attacked and Foullon-Norbeeck, as well as three sailors and a guide, were killed. He was born in 1850, and was at the time of his death chief geologist of the geological bureau at Vienna.

Dr. Theodore Marbe, professor of zoology at Buda-Pesth, died on September 5th at the age of 80 years. He was known especially for histological researches on muscles and nerves, but had also made contributions to zoology, and had formed in the University at Buda-Pesth a laboratory of zoology and a museum of comparative anatomy.

Baron Sir Ferdinand von Müller, the eminent botanist, died at Melborne on October 9th. From the London *Times* we take the following facts: Müller was born at Rostock in Germany, in June, 1825. He obtained a training in pharmacy and in his leisure time devoted himself to the study of botany and chemistry. In 1846–47 he studied at the University of Kiel, where he took the degree of Ph.D. For several years he investigated the botany of Schleswig and Holstein. In 1847, in order to counteract a hereditary tendency to phthisis, he emigrated to Australia, and at once entered upon those labors for the exploration and development of the continent which have only ceased with his death. From 1848 to 1852 he traveled over 4,000 miles, mainly for botanical purposes. In 1852 he was appointed government botanist to the colony of Victoria. In 1855–56 he accompanied as botanist the expedition under the command of A. C. Gregory for the exploration of north and central Australia, and was one of the four to reach Termination Lake, in central Australia. Some 6,000 miles of previously unknown land was traversed, and abundant collections made of the various forms of vegetation. On Müller's return to Melbourne he was

garded as of special interest. He said that while continental laboratories were supported by the State, in England they received practically no government support, and very little from the community, usually depending on the generosity of single individuals. As a result they were undermanned, and a large amount of public health work from which the community would profit remained undone. Each municipality should endow a laboratory, in which, besides original research, work required by the medical officer of health and the sanitary authorities could be done. The scheme he submitted presented very few difficulties. In the discussion that followed Prof. Haycraft mentioned that a commencement had already been made in South Wales. Dr. Hope thought it might soon be in operation in Liverpool, and Prof. Delepine described the arrangements already in existence in Manchester.

A PRIZE of £50, to be called the *Welby Prize*, is offered for the best treatise upon the following subject: The causes of the present obscurity and confusion in psychological and philosophical terminology, and the directions in which we may hope for an efficient practical remedy. Competition is open to those who, previously to October 1, 1896, have passed the examinations qualifying for a degree at some European or American university. The donor of the prize desires that general regard be had to the classification of the various modes in which a word or other sign may be said to possess 'meaning,' and to corresponding differences in the conveyance or interpretation of 'meaning.' The Committee of Award will consider the practical utility of the work submitted to them as of primary importance. The essays, which may be written in English, French or German, must be typewritten and extend at least to 25,000 words. They should be headed by a motto and accompanied by a sealed envelope containing the name of the writer. Manuscript from America should be sent to Prof. E. B. Titchener, Cornell University, Ithaca, N. Y., and must reach him not later than October 1, 1897. Other members of the committee are Prof. James Sully, London; Mr. G. F. Stout, Aberdeen, and Prof. O. Külpe, Würzburg.

UNIVERSITY AND EDUCATIONAL NEWS.

A DESPATCH from San Francisco says that the University of California is to be made richer by $4,000,000 by donations from various persons, chief among whom is Mrs. Phœbe Hearst, widow of Senator Hearst, of California. This amount is not to be given all at one time, but will be paid as soon as the State is prepared to make proper use of the money. The State must spend $500,000 on buildings, and when this is done the gifts will be paid. These facts became known at the meeting of the Board of Regents of the University when Mrs. Hearst sent a note to the board donating $15,000 to be used in securing plans for new buildings. Mrs. Hearst stated that she would erect two buildings at her own expense, one of which would be a memorial to her late husband. The names of others who will give funds are withheld.

FROM notices in the daily papers it appears that the registration at several universities is as follows: Yale, 2,515, an increase of 100 over last year; Columbia, 1,760, an increase of 130; Cornell, 1,720, an increase of 109; Chicago, 1,126, an increase of 17; Massachusetts Institute of Technology, 1,184, an increase of 12.

THE corner stone of Brinckerhoff Hall and Millbank Hall, of Barnard College, were laid on October 24th. The corner stone of Brinckerhoff Hall was laid by the Dean of the College, representing Mrs. Van Wyck Brinckerhoff, and the corner stone of Millbank Hall was laid by Miss Eleanor Millbank Anderson. Addresses were made by President Low, of Columbia University; by Mr. Silas B. Brownell and by Bishop Potter.

THE corner stone of the Hall of History of the American University, at Washington, was laid on October 21st. An address was made by Bishop John F. Hurst, Chancellor, and by other prominent leaders in the Methodist Church. The building is to be built of white marble in Ionic style, and is the first of the six buildings that have been planned.

THE board of directors of the Catholic University at Washington have chosen as nominees for the office of rector of the University, Rev. Father T. J. Conaty, rector of the Sacred Heart parish of Worcester, Mass.; Rev. Father Dan-

Dr. E. R. L. Gould, professor of statistics in the University of Chicago, has prepared, at the request of Mayor Strong, a plan for a bureau of statistics for Greater New York. The commission will be asked to include it in the new city charter.

Dr. Herbert S. Jennings has been appointed to the Smithsonian Table at the Naples Zoological Station for three months. Prof. Francis H. Herrick will occupy the table during the month of November.

At the recent meeting of the British Association Mr. R. T. Glazebrook read the report of the Committee on Electrical Standards, which has had under consideration a thermal unit. The Committee in question issued circulars to authorities on the measurement of heat in other countries, and received many written opinions on the matter. Most of the writers wish to see some multiple of the erg adopted as the theoretical unit, but there are differences of opinion as to the multiple to be chosen. There is a fairly general agreement that as a practical unit the heat required to raise one gramme of water 1 deg. Centigrade must be taken, but views differ as to the initial temperature of the water. The weight of opinion is also in favor of the hydrogen thermometer being used for temperature measurements. The committee learn that a committee of the French Physical Society have the question at present under consideration, and suggest an international discussion on the subject.

The German Hygienic Association offers a prize of $1,200 for a research essay on the efficiency of electric heaters.

The Bender Hygienic Laboratory, of the Albany Medical College, was dedicated on October 27th. The building was formally presented to the Board of Trustees by Mr. H. H. Bender in the name of the doner, Mr. Matthew W. Bender, and addresses were made by Dr. George E. Gorham and Prof. A. Jacobi.

The Baltimore Naturalists' Field Club, which is composed of instructors and advanced students of the biological department of Johns Hopkins University, has elected Dr. C. P. Sigerfoos as President. Dr. F. S. Conant is chairman of the zoological section, Dr. J. E. Humphrey of the botanical section, and Dr. R. M. Bagg of the geological section. The Club holds field excursions on Tuesday afternoons during the autumn and spring.

The proposed mathematical club at the University of Pennsylvania has now been organized. Prof. Doolittle has been elected President; Prof. Goodspeed, Vice-President, and Prof. Crawley, Secretary. The club will meet once a month.

The Yerkes Observatory is now nearing completion, and about half of the faculty of the astronomical department of the University of Chicago will hereafter be in residence there.

The Dominion government is making a thorough survey of the currents in the Gulf of St. Lawrence. During the present season the steamship *Lansdowne*, of the marine department, has been engaged in studying the eastern arm of the gulf from Anticosti to Belle Isle, and in the almanacs of the present year tide-tables are given from the records obtained.

Mr. Lucas reports the capture of a specimen of the Ribbon Seal, *Histriophoca equestris*, in Bering sea. The individual, a young female, was taken by one of the sealing schooners about 84 miles due west of St. Paul Island, a very southern locality for this species, especially in August, when the capture was made.

Prof. L. H. Bailey has prepared a report for the Commissioner of Agriculture regarding the State appropriation, amounting to $32,000, for extending university instruction in horticulture. The work consists of the issue of bulletins for the benefit of farmers, of experiments on model farms, intended for imitation in the district, and the holding of district schools. Prof. Bailey wishes to extend further the work so that nature study may be taught in all normal schools and introduced in district schools. He recommends the establishment of a State bureau for correspondence and instruction, and wishes the teachers in the schools to cooperate with the farmers in the study and improvement of agricultural methods.

Dr. Woodhead read a paper at the Liverpool meeting of the British Association on the 'Organization of Bacteriological Research in Connection with Public Health,' which was re-

plinary form. They have quite generally followed a plan which has so good a warrant as the example of the Johns Hopkins University. The biological work was there developed along zoological lines while the botanical remained in a condition perhaps to be termed inadequate. It certainly seems better to place some lines of instructions upon a fairly adequate basis than to make all inadequate by trying to cover them all. If geology cannot be taught as a matter of discipline without sacrificing biological, chemical or physical instruction, should it be excluded altogether? I cannot think so, geology has a value as information and may be so imparted as not to give the student any undue sense of having learned all that can be learned. That it is so treated in many of our colleges and that the results are good I wish to bear most emphatic testimony. Few institutions can feel that they are accomplishing all that they would like to do. It is, however, true that in many a small college teachers of real power and inspiration are sacrificing the opportunity to make themselves known and recognized in their sciences in order that they may make their instruction more adequate. That they are succeeding is clearly evidenced by the steady stream of men who are passing from their institutions in the graduate courses of the universities.

L. W. CHANEY, JR.

CARLETON COLLEGE,
NORTHFIELD, MINN.

SCIENTIFIC LITERATURE.

Life Histories of North American Birds, from the Parrots to the Grackles, with special reference to their breeding habits and eggs. By CHARLES BENDIRE, Captain and Brevet Major U. S. A. (Retired). Smithsonian Contributions to Knowledge. Large 4to, pp. 518, col. pls. 7. Dated 1895; published September, 1896.

Probably no work on American birds since Audubon's Ornithological Biographies has been looked for with greater eagerness than the second volume of Bendire's 'Life Histories of North American Birds.' The first volume was a surprise, both to ornithologists and to the public. A good book was expected, but no one was prepared for the great mass of new information it contained or for the high technical knowledge shown in its preparation. The colored plates of eggs were the finest ever produced, and the demand for the work was so great that, although sold at the relatively high price of $7.50, the edition was soon exhausted. Naturally, the appearance of the second volume has been anxiously awaited by all classes of bird lovers from the technical ornithologist to the popular observer. On running over its handsome pages one is impressed by the fact that it is even better than the first, and that the plates also, if possible, are superior.

The scope of the work is comprehensive. All of the birds of the American Continent occurring north of Mexico are included. The first volume contained 416 large quarto pages and 12 colored plates, and treated of the Grouse, Pigeons, Hawks and Owls—146 species and subspecies in all. The present volume comprises 518 pages and 7 colored plates of eggs. It treats of the Parrots, Cuckoos, Anis, Roadrunner, Trogon, Kingfishers, Woodpeckers, Nighthawks, Poor Wills, Swifts, Hummingbirds, Flycatchers, Larks, Magpies, Jays, Crows, Orioles and Blackbirds—in all about 200 species and subspecies. The classification and nomenclature of the A. O. U. Check List are followed and references are given to the first name of the species and to the combination adopted. Following this brief synonomy is a complete concordance to the numbers the species bears in each of the five check lists from Baird's original list of 1855 to the American Ornithologists' Union list of 1895. The geographic range of the species is then summarized in a brief paragraph and is afterward given in greater detail, along with the dates of arrival at different points in its migratory range, the relative abundance of the species in different localities, and the local names by which it is known. Much attention is given to food and breeding habits, the accounts of which are graphically written and, as a rule, form the greater part of the biographies. Except in the very few instances in which the eggs are unknown, the history closes with a description of the nest and eggs, with average, maximum and minimum measurements (both in millimeters and inches).

The greater part of Major Bendire's life has

iel Riordan, pastor of St. Elizabeth's parish, Chicago, and Rev. Father Joseph F. Mooney, vicar-general of the diocese of New York, and from these the Pope will select the rector, who will probably be the first recommendation of the board. The board of directors decided that the term of rector should be limited to six years.

THE will of the late P. B. O'Brien, of New Orleans who died a few days ago, leaves $150,000 to the Catholic University at Washington to endow three chairs.

DISCUSSION AND CORRESPONDENCE.

HALSTED ON THE STRAIGHT.

HAVING returned from Russia so recently as not yet to be abreast of our current scientific literature, it is to the courtesy of the editor of SCIENCE that I owe my knowledge of the appearance in that journal of an important note by Prof. Fiske, headed 'The Straight Line as a Minimum Length.'

This note is right in maintaining that for the comparison of non-congruent lines, *e. g.*, the straight and circle, an assumption in addition to those of Euclid is essential. The strange thing about it is that in stating what Prof. Halsted 'appears to believe,' Prof. Fiske credits me with ignorance of the very principle which I of all the geometers have set forth most strenuously. To attract particular attention to it, I, in my Elementary Synthetic Geometry put it in the following somewhat bizarre form:

"In accordance with our definition of equivalent magnitudes, as such as can be cut into pieces congruent in pairs, no arc can be equivalent to a sect [piece of a straight]."

For the sake of comparison we make the following assumptions:

1. No arc is less than its chord.

2. No minor arc is greater than the sum of two tangents from the same point to its extremities.

By these paradoxal assumptions we attribute length to the curve, and can, *e. g.*, evaluate the circle in terms of its diameter to any desired degree of approximation."

GEORGE BRUCE HALSTED.

THE CURVE-TRACING TOP.

EDITOR OF SCIENCE: In your issue of October 9th, Mr. Warring refers to the very interesting and instructive article by Prof. Barus on the curve-tracing top or 'gyrograph,' which article appeared in SCIENCE on September 25, 1896. Mr. Warring suggests as an improvement in the apparatus that, instead of a lead pencil and paper arrangement, a smoked glass be used, the plate to be afterwards flowed with thin varnish. I would suggest, as a further modification, a very simple process which I have found of great convenience and service in a number of self-registering and tracing devices. Long ago I discarded the use of smoked glass in favor of glass plates coated with a thin layer of printer's ink. The ink can be applied with an ordinary hand-press roller, and can be distributed with almost perfect uniformity. The plate so prepared should receive the tracing while the ink is wet; then by exposure to the air the ink dries and the record is comparatively permanent. Such a plate may be used as an ordinary photographic negative in making blue prints or silver paper copies.

JAS. E. TALMAGE.

UNIVERSITY OF UTAH,
SALT LAKE CITY, UTAH.

GEOLOGY IN THE COLLEGES OF THE UNITED STATES.

IN the discussion and correspondence of October 2d, Mr. F. W. Simonds, of the University of Texas, discusses Prof. T. C. Hopkins' report on this subject. It seems to me that Prof. Simonds treats altogether too severely those smaller colleges which still give courses in his judgment inadequate. It is scant justice to class all those who do not furnish contributions to geological literature as amateurs. It does not follow that a teacher who is occupied with details of administration to the exclusion of authorship is not quite as good a teacher as another who may contribute many papers.

The contention that geology is a subject of as great disciplinary value as the other sciences no one will dispute.

The situation in the smaller colleges is something like this: Many of them are unable to develop all lines of scientific work in a disci-

been spent in the West, where, as a military officer, he has been stationed at remote outposts from the Mississippi Valley to the Pacific Coast, and from Arizona to Oregon. During his army life he took part in various Indian wars and had command of various exploring expeditions, traveling thousands of miles on horseback over the deserts and mountains of the far west. He thus had very exceptional opportunities for the study of birds in the field. On his retirement from the army he came east, at the solicitation of Prof. Baird, and was made Honorary Curator of the Department of Oology in the United States National Museum, which position he still holds. When he came he brought with him the largest and most valuable collection of birds' eggs ever gathered by one person in America, a collection numbering about 15,000 eggs.

Professor Baird, knowing the extent and value of Major Bendire's field notes, asked him to write a work on our birds, with special reference to their breeding habits, but unhappily did not live long enough to see even its beginning.

Since coming east Major Bendire has spent several summers in the field, chiefly in the Adirondack region in northern New York, thus supplementing his knowledge of the habits of western birds by studies of our eastern species. He is a keen observer and his wide field experience has made him personally familiar with nearly all the species of which he writes. In addition to his own notes he has secured from others a large mass of unpublished manuscript prepared expressly for the present work. The quantity of this original contributed matter is surprising and is vastly greater than that brought together by any author since the time of Audubon.

The work does not require comparison with any other, because no other covers the same ground. It is not in any sense a technical treatise and does not contain descriptions of the birds themselves, though in the case of closely related geographic races the points of difference are often clearly stated. On the other hand, unlike the works of Audubon and Wilson, it contains little in the way of personal narrative, although now and then the pages are enlivened by an anecdote or entertaining bit of personal experience. So far as the geographic distribution, food habits and breeding habits go, it is not too much to say that the work fairly represents the state of knowledge on these subjects at time of going to press. The proofs of the second volume were read more than a year ago (in June 1895) and the book is dated 1895, but through unfortunate delays in the Government printing office, it did not appear till September of the present year (1896). The reprehensible practice of some of the departments of Government of permitting their publications to bear a date a year or more anterior to the actual date of publication, cannot be too strongly condemned.

Bendire's 'Life Histories' is the only book ever published that contains reliable 'down to date' accounts of the food habits and breeding ranges of our birds, with descriptions of their nests and eggs. Special attention has been given to the geographic distribution of the various species, but the ranges are defined by means of political and geographical boundaries without reference to the faunal areas. The work as a whole is indispensable to students of North American birds and will long remain the standard authority on the subjects of which it treats. Both the author and the Smithsonian Institution are to be congratulated on the excellence of the colored plates, which were drawn by John L. Ridgway and reproduced by Ketterlinus. C. H. M.

Economic Entomology for the Farmer and Fruit Grower, and for Use as a Text-book in Agricultural Schools and Colleges. By John B. Smith, Sc. D. J. B. Lippincott Company, Philadelphia. 1896.

Dr. Smith's experience as a teacher of economic entomology and as an investigator in this field has eminently fitted him for the authorship of this volume, just received from the press. Entomologists have been very fortunate during the past two years in witnessing the publication first of Comstock's admirable 'Manual for the Study of Insects,' second, Dr. Sharp's excellent consideration of the class 'Insecta' in Volume V. of the Cambridge Natural History and lastly of the volume now before us. Dr. Smith, in writing specifically for the farmer and fruit grower, and for the students in agricultural colleges and schools has

covered a restricted ground and it goes without saying that he has done it well. In fact, it is difficult to see how it could be bettered. The volume is compact, abundantly illustrated, and contains nothing that is unnecessary. At the same time, it may almost be said that it omits nothing that is necessary, when we consider its especial objects. To cover the whole subject in a volume of less than 500 pages, using, at the same time, nearly 500 text figures, necessitates the most careful selection of material, yet so excellently has this been done and so happily has the text been prepared that there is on the one hand no appearance of forced condensation and on the other no semblance of superficiality. The illustrations for the most part have been borrowed, from which it results that there is great lack of uniformity in their excellence, some of them being extremely good and others very poor. The author evidently endorses the idea that a poor illustration, if not absolutely incorrect, is better than none. Nevertheless, it seems to us that such figures as those of *Agallia sanguinolenta*, *Anasa tristis*, *Necrophorus Americanus*, *Silpha Americana*, *Edema albifrons*, *Cacoecia rosaceana*, *Bibio albipennis*, *Ceraphron triticum* and perhaps a dozen others, should have been redrawn for a work of so many other excellencies. The author has made use of photography in some of his illustrations, but it must strike every one in glancing at his plate of bees, for example, that this method of illustration is only of value where great pains have been taken with the prior mounting and preparation of the subject.

These slight blemishes, however, detract little from the value of the book, which will undoubtedly soon be in the hands of every teacher of economic entomology in the country, and, let us hope, of very many of the rapidly growing class of scientific farmers and fruit growers.

L. O. HOWARD.

SOCIETIES AND ACADEMIES.

NEW YORK ACADEMY OF SCIENCE; BIOLOGICAL SECTION, OCTOBER 12, 1896.

DR. BASHFORD DEAN and Mr. G. N. Calkins presented preliminary reports upon the results attained at the Columbia University Zoological Laboratory at Port Townsend, Washington. The expedition spent about six weeks in exploring and collecting, and brought home large collections from exceptionally favorable collecting grounds. Dr. Dean spent some time at Monterey, Cal., and brought home collections of eggs and embryos of *Chimaera* and *Bdellostoma*.

Dr. J. L. Wortman made a preliminary report upon the American Museum Expedition to the Puerco and Wasatch beds. He reported finding a connecting link between the close of the Cretaceous and the beginning of the Tertiary. He gave an interesting account of the massive ruins of the so-called cliff dwellers in the region visited by him. In the Big Horn basin the expedition had remarkable success, as well as in the Wind River basin.

Prof. Osborn stated that with the collections made this summer the American Museum could now announce that their Eocene collection was complete, containing all mammals now known in the Eocene; that their collection from the Wasatch bed was the finest in existence and that from the Wind River basin was complete; the Bridger was represented by all but two or three types, and fine collections have been made in the Uinta.

Mr. W. J. Hornaday made a report of a tour of inspection of foreign zoological gardens, made under the auspices of the New York Zoological Society. He visited fifteen gardens in England and on the Continent, studying the features of excellence in each.

Prof. Bristol gave a brief account of the progress at the Marine Biological Laboratory at Wood's Holl, Mass., during the past summer.

Prof. Osborn offered the following resolution on the death of Prof. G. Brown Goode, after paying a tribute to his memory:

Resolved, That the members of the Biological Section of the New York Academy of Sciences desire to express their deep sense of loss in the death of Prof. G. Brown Goode, of the U. S. National Museum. In common with all naturalists in this country, we have admired his intelligent and highly successful administration of the National Museum, as well as his prompt and ready response to the requests and needs of similar institutions throughout the country.

In face of the arduous and exacting duties of his directorship he has held a leading position among American zoologists and we are indebted to him for a

series of invaluable investigations, especially upon the fishes.

Those of us who had the good fortune to know Prof. Goode personally recall his singular charm of character, his genial interest in the work of others, his true scientific spirit. We have thus lost one of our ablest fellow-workers and one of the truest and best of men.

The resolution was adopted unanimously by a rising vote.

CHARLES L. BRISTOL,
Secretary.

ANNUAL MEETING OF THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY.

THE annual meeting of the New York Section of the American Chemical Society was held at the College of the City of New York on Friday, October 9th, at 8:15 p. m.

The following officers were elected: Dr. Wm. McMurtrie, chairman; Dr. Durand Woodman, secretary and treasurer; Dr. Charles A. Doremus, Prof. A. A. Breneman, Dr. Albert C. Hale, members of the executive committee; Dr. Wm. McMurtrie, Dr. Chas. F. McKenna, Dr. Chas. A. Doremus, delegates to the Scientific Alliance of New York.

Papers were read and discussed as follows: On 'Some Disputed Points about the Light of Carbon,' by Woodbridge H. Birchmore. On 'The Conversion of Cows' Milk into a Substitute for Human Milk,' by Henry A. Bunker.

Committees were appointed to cooperate with other scientific bodies in New York for the purpose of securing a lecture from Prof. Henri Moissan before his return to France, and to arrange the programs for the meetings of the Section during the year.

The prospects of the Chemical Club were reported as very encouraging.

DURAND WOODMAN,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

AT the meeting of the Academy of Science of St. Louis, held October 19, 1896, Mr. Trelease exhibited living flowers of *Catasetum Gnomus*, demonstrating the extreme irritability of their tentacles and the precision with which the pollinia become attached to any object touching either tentacle. Mr. J. B. S. Norton presented a list of the Ustilagineæ of Kansas, together with the result of germinations of about one-half of the entire number. Three persons were elected to active membership.

WILLIAM TRELEASE,
Recording Secretary.

SCIENTIFIC JOURNALS.

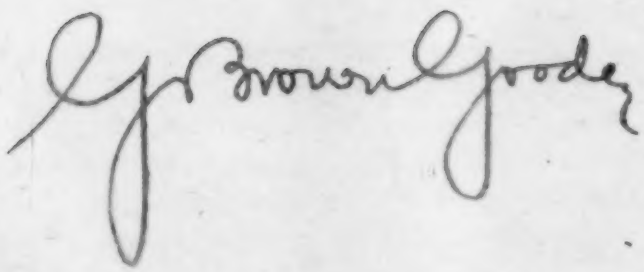
THE AMERICAN GEOLOGIST, OCTOBER.

Dinicthys Prentis-Clarki: E. W. CLAYPOLE. A new species of this interesting genus of Devonian fishes is described.

The Fort Union Formation: WALTER HARVEY WEED. The conclusion long ago expressed by Newberry now seems to be definitely settled, viz., that the Fort Union beds are lower Tertiary and entirely distinct from the Laramie proper which is upper Cretaceous. The series in Montana is as follows; beginning with the lower Laramie (= Cretaceous), Livingston (transition), Fort Union (Eocene).

N. H. Winchell and U. S. Grant describe a volcanic ash from the north shore of Lake Superior. The existence of such deposits in this region has generally been doubted. No craters or vents have as yet been located.

A very complete synopsis of the geological papers presented at the Buffalo meetings of the Geological Society and the American Association is given by Warren Upham.

The 'Augen' Gneiss area, Pegmatite veins and Diorite dikes at Bedford, N. Y., are described at length by Luquer and Ries. The 'augen' are considered as the result of metamorphism by pressure of granitic or aplitic rocks, together with a granulation of the minerals from shearing, the unsheared portions of the rock remaining as 'augen.' The pegmatite veins and diorite dikes are of later origin as their component minerals are in their normal condition without signs of dynamic action.

James M. Safford notices a 'New and important source of Phosphate rock in Tennessee.' It differs conspicuously from any other deposit in the State in not being an original rock deposit, but one which has been produced by the leaching out of limestones rich in phosphates. This has raised the percentage of calcium phosphate to from 60 to 80 per cent. The age of these deposits is determined to be Trenton and their thickness ranges from three to eight feet.